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(54) Device for portioning foodstuffs, in particular ground meat, to be packed in trays or the like

(57) The invention relates to a portioning device for the packaging in trays or the like of a pre-established amount of ground meat, supplied through an extrusion plate of a grinder, which lays down a mass of ground

meat in a continuous strip on a flat belt conveyor.

The portioning device generates metered portions of ground meat by means of a cutting element which operates in cooperation with a fixed flat element located above the flat belt conveyor.

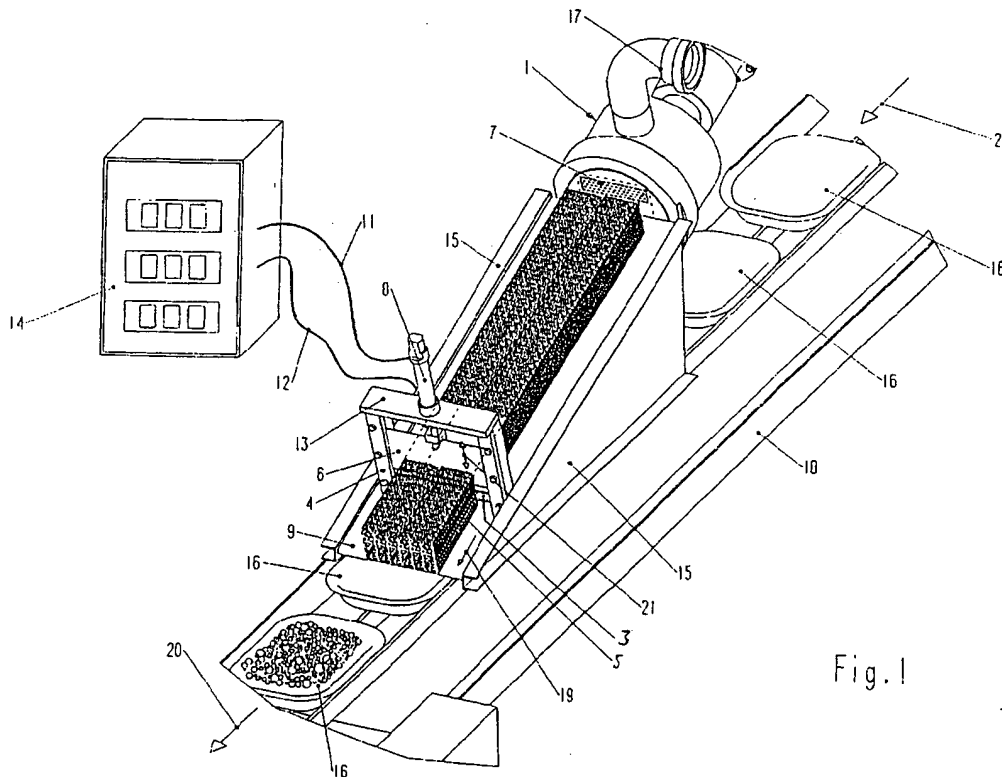


Fig. 1

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## Description

[0001] The present invention relates to a portioning device which generates metered portions of meat ground by a grinder by means of a shear-like cutting element operating above a single belt conveyor.

[0002] More specifically, the invention relates to the constructional improvement for the metered filling of trays or similar containers to be conveyed to a packaging unit.

[0003] A grinder which generates in a continuously ground meat to be conveyed to the packaging process is well-known to the skilled in the art.

[0004] Higher and higher speed and reliability requirements are required for foodstuff packaging in industrial production, in particular in the meat food industry. Namely, foodstuffs, when outputted from a processing machine such as a meat grinder, must be quickly portioned in order to be collected in pre-established amounts in a completely mechanized way in containers or tray-like packaging or plastic-sheet as well.

[0005] Today, production speed tends to increase in every operational stage in order to obtain a higher number per minute of packed products to be conveyed to the distribution chains. The productivity of operational processes and the output of operational equipment and/or devices heavily affect successful competition on the market for the allotment of industrial supplies. As a consequence, manufacturers of industrial goods strive to achieve better and better performances for their machines and equipment, at the lowest possible cost and with reasonable reliability. Research on performance improvement must take the road of sharp improvement of all components and devices which make up the production line and all related aspects. Thus, the research on improved construction for operational devices and/or means, tends to obtain an overall production line of improved quality, that is of higher technological content joined with constructional simplifications of some importance. The operation being the same, constructional simplifications applied to operational means in practice eliminate most of the drawbacks which may arise during the manufacturing process. Impediments to the manufacturing process, even if reduced to a slight impact in percentage, become of great importance because of the delay they cause during the subsequent stages of the production cycle, due to the high production rate of present manufacturing processes.

[0006] There are known portioning devices based on the use of two flat belt conveyors, one subsequent to the other, which convey the ground meat supplied through the extrusion plate of a grinder. This kind of application is based on the use of a portioning device operated between the two conveyors in order to generate measured portions of ground meat. Incidentally, the cutting blade for shearing said portions of meat is located in the space between the two belt conveyors. Of course shearing, in order to generate the measured portions of

ground meat in the known applications, cannot take place along the belt conveyor, because the cutting blade would cut into the conveyor itself. The known application illustrated above causes some drawbacks which make its application limited.

[0007] The application, in fact, presents some drawbacks which make its manufacturing and assembling stages difficult and, as a consequence, implies high manufacturing costs, together with a not-so rational operation from the functional view point. Such drawbacks consist mainly of the presence of two belt conveyors which cause a double motion and are manufactured using several mechanical elements joined and fastened one to the other, with high overall costs. Moreover, additional elements are needed for their logical operational coordination; all this helps to raise the final cost of such processing equipment, and to cause management problems of relative importance to the operators assigned to the control of the manufacturing process.

[0008] Having in mind what set forth above, the primary objective of the present invention is to provide a single belt conveyor for conveying the ground meat from the extrusion plate of the grinder to filling the trays and, moreover, to simplify the conveyor itself in its construction. One aim, which also makes up a primary objective of the present invention, is to portion the product in a safe way on the belt itself by operating a shear-like cutting blade.

[0009] Another aim of the present invention is that the portioning device be free from drawbacks and allow good visibility along the path of the strip of ground meat to be packed in the trays.

[0010] A further aim of the present invention is that the portioning device will provide a simple structure, easy to implement, operating safely and effectively, and moreover of relatively low price.

[0011] Such objectives and such aims are all attained by the portioning device of the present invention, which provides a flat fixed element located crosswise above the flat belt conveyor and a cutting element for cutting the ground meat strip into portions in coordinated cooperation. Said flat fixed element comprises a short angled initial section for lifting the meat strip and a short flat terminal section provided with a crosswise slot for the portioning cut of ground meat for filling the trays.

[0012] According to a practical embodiment the portioning device of the present invention is located in proximity to the end of the belt conveyor on the side of the trays' filling, and operates the cutting element when the belt conveyor is stationary.

[0013] With reference to what set forth above, the following description, shown simply as a non-limiting example, will serve the purpose of illustrating the invention in object with reference to the figures of the annexed drawings wherein:

figure 1 is a view in axonometric perspective of the portioning device of the present invention showing

the cutting instant of the cutting blade operated over the belt conveyor for generating metered portions of ground meat which will be placed in the packing tray, and, moreover, schematically shows the extrusion plate of the grinder which supplies the ground meat, arranging it continuously in a string of parallelepipedal shape on the belt conveyor itself; and figure 2 is a schematic side view showing the transverse fixed flat element which lifts the ground meat strip from the belt conveyor in the cutting area, and, moreover, schematically shows the overhanging cutting blade with the underlying trays.

**[0014]** The machines and/or devices operating in reciprocal cooperation with the portioning device of the present invention will not be illustrated or described in their operation, as they are already known, and anyway they don't fall into the scope of the present invention.

**[0015]** For the sake of clarity of the assembly, in the figures same or equivalent parts are indicated by identical reference fonts.

**[0016]** The operation of the portioning device of the present invention will be hereinafter disclosed with reference to the figures of the annexed drawings.

**[0017]** A block 1 of a grinder supplies by means of an extrusion plate 7 the ground meat, which usually is thrust-fed through tube 17, the whole as it is well-known to the skilled in the art. Ground meat is laid in a continuous way on a flat belt conveyor 9, and on said conveyor 9 it is shaped into a parallelepipedal strip 2 moving along direction 19 due to the motion of conveyor 9 itself, which revolves around a roller 10. The revolving rollers, the flat conveyor and its relative drive unit (not illustrated) are advantageously supported by and assembled on a mount 15. The strip of ground meat 2 proceeding along conveyor 9 passes underneath a cutting frame 13 with a fixed structure provided with uprights 4 fastened to the mount 15. The parallelepipedal strip mass 2 of ground meat is lifted during its passage under the frame 13, spacing it out from conveyor 9 by means of a transverse flat element 3 advantageously profiled with a first angled section tangent to the conveyor, followed by a flat section on which a slot has been cut in order to allow the passage therethrough of the cutting blade 6.

**[0018]** Incidentally, the amount of the above-mentioned lifting is such as to ensures the lack of contact between the blade 6 and the conveyor 9 during all cutting steps.

**[0019]** At the instant when the length of the meat string 2 which has passed under the cutting blade 6 matches the metered portion 5 to be packed in the tray 16, a control board 14, programmed at pre-set values, generates a control which operates, preferably by means of a pneumatic operation, an actuator 8 which moves the cutting blade 6 from position 6 to position 6a and brings it back to the starting position 6 according to an alternated up and down motion 21.

**[0020]** During the cutting operation 21 the flat convey-

or 9 is stopped while the actuator 8 is operated by the control fluid operating through tubes 11 and 12.

**[0021]** At the end of the cutting operation the conveyor 9 starts moving again along a direction 19 in order to place, in adjusted coordinated motions, the metered portion of meat 5 in the tray 16 which proceeds along a direction 20 by means of a plane conveyor provided with a supporting structure 18.

**[0022]** While the metered portion 5 of ground meat is laid down in the tray 16, the strip 2 of ground meat proceeds along direction 19 as far as is needed in order to make up again the measured portion which undergoes the new subsequent cutting operation by the blade 6. The operational cycle of the portioning device illustrated above is renewed automatically in the presence of a continuous supply of ground meat extruded from the grinder 1, in order to fill a plurality of trays 16 to be sent to the packaging process.

**[0023]** The portioning device designed as illustrated above is susceptible of modifications and variations, all of them falling within the scope of the invention's concept.

**[0024]** Furthermore, all details can be replaced by technically equivalent ones.

**[0025]** It is also obvious that the materials used, as well as the shapes and dimensions, can be of any kind, depending on one's needs, without being excluded from the protective scope of the claims illustrated hereinafter.

## Claims

1. A portioning device for packaging in trays or similar containers a pre-established amount of foodstuff, in particular ground meat supplied by an extrusion plate (7) of a grinder (1) which lays a mass of ground meat delivering it evenly in the shape of a parallelepipedal strip (2) or the like on a belt conveyor (9) which proceeds from the area underlying said extrusion plate (7) to the filling area for trays or similar containers (16), said portioning device being characterized in that it is provided in coordinated cooperation with a flat fixed element (3) located crosswise above said belt conveyor (9), in order to lift for a length the mass of ground meat in the shape of a strip from the conveyor (9), and a cutting element (6), located at said flat fixed element (3), which operates at pre-set instants in order to generate metered portions (5) of meat.
2. A portioning device for the packaging into a tray or similar container of a pre-established amount of ground meat according to claim 1, characterized in that said flat fixed element (3) is provided with an initial angled section for changing from a grazing crosswise position with respect to said conveyor (9) to a lifted position spaced from the conveyor (9) and proceeding with a flat linear terminal section wher-

eon is cut a crosswise slot for allowing the passage therethrough of said cutting element from a rest position (6) to a portioning position (6a), said flat terminal section supporting and spacing out the strip (2) of ground meat from the conveyor (9).

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3. A portioning device for the packaging in a tray or similar container of a pre-established amount of ground meat according to claims 1 or 2, characterized in that said flat fixed element (3) and said cutting element (6) are positioned in proximity to the end roller (10) of said belt conveyor (9).
4. A portioning device for the packaging in a tray or similar container of a pre-established amount of ground meat according to any of preceding claims, characterized in that the portioning operation generated by said cutting element (6) is carried out when the belt conveyor is stationary.

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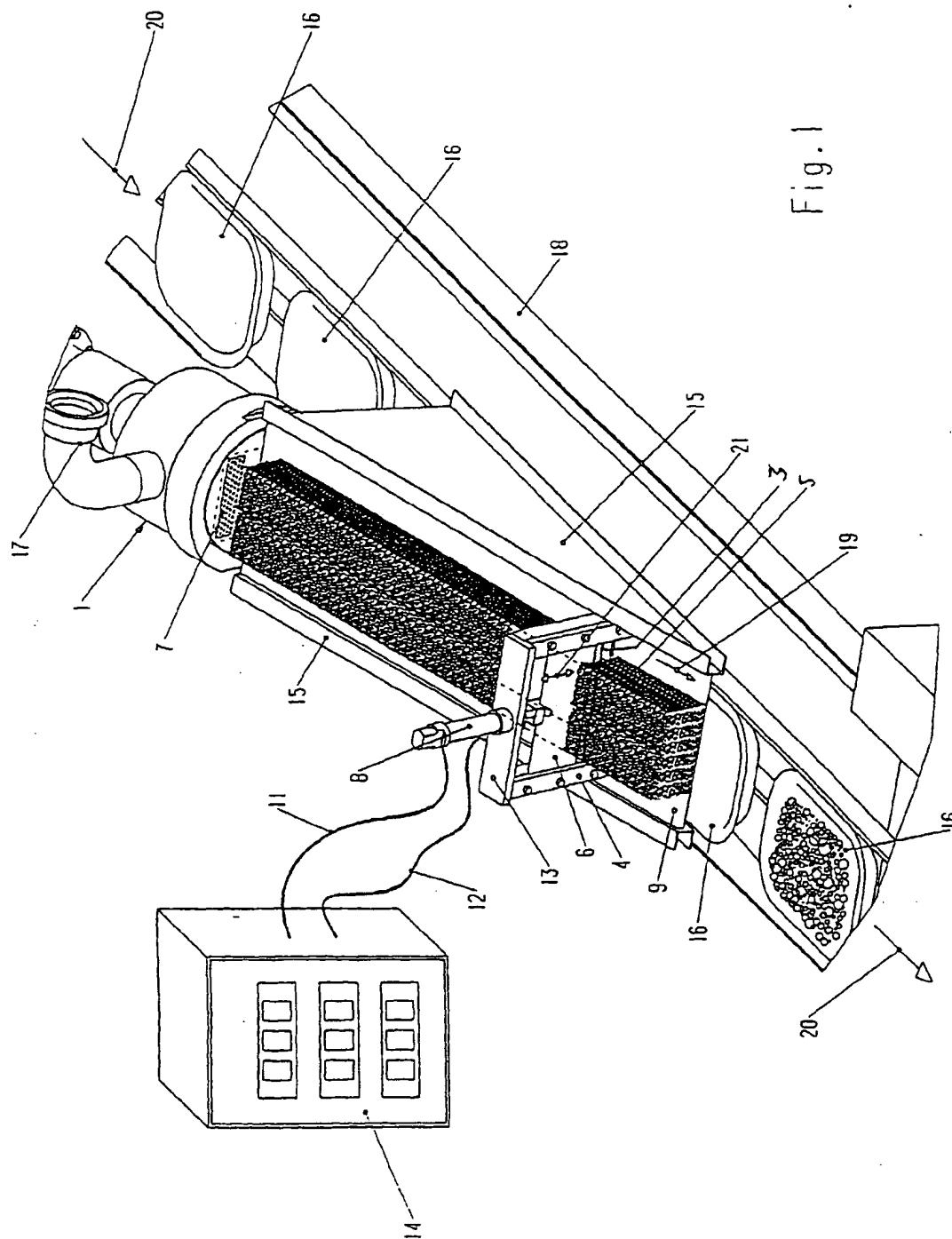


Fig. 1

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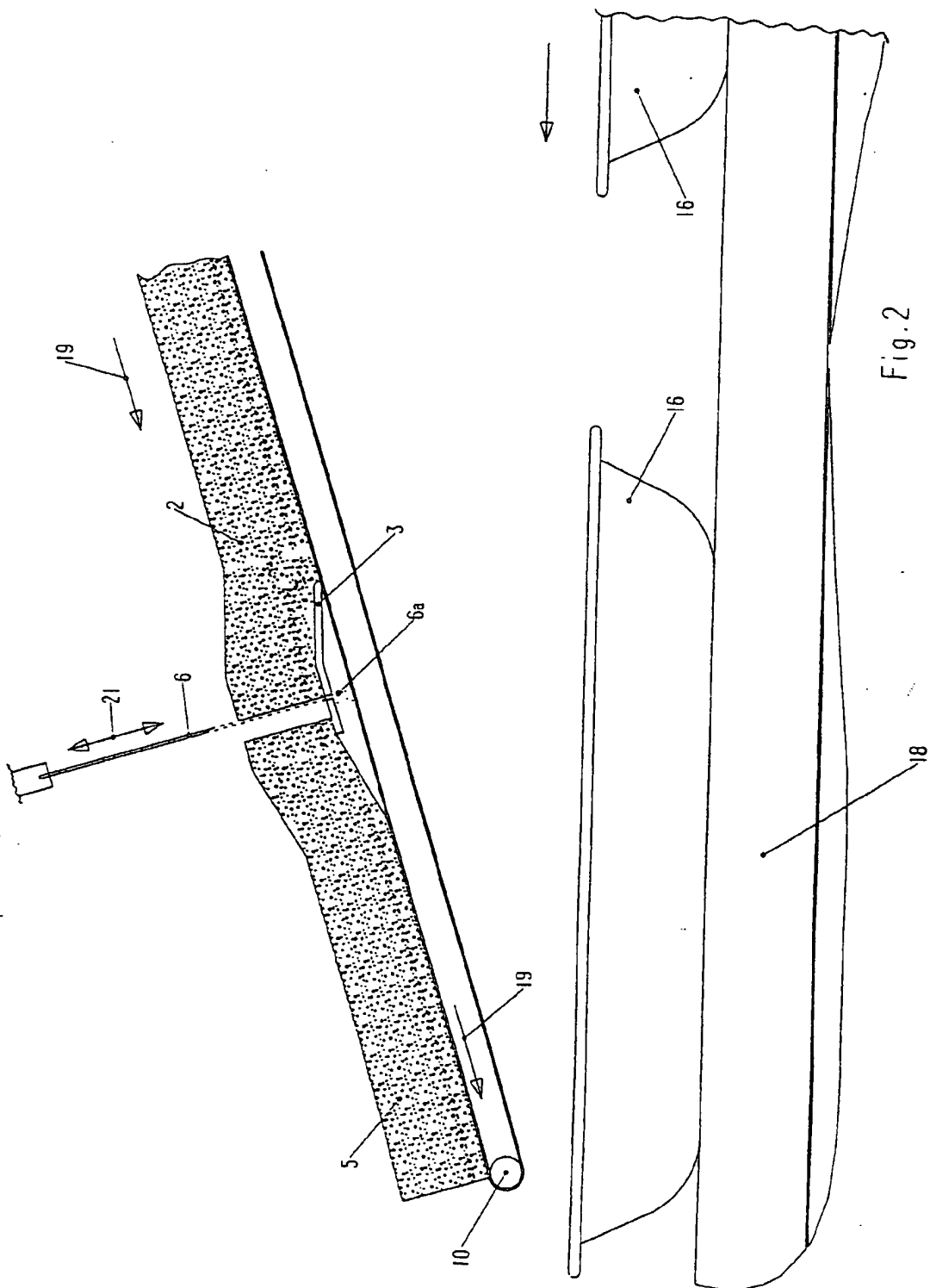
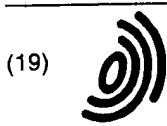


Fig. 2

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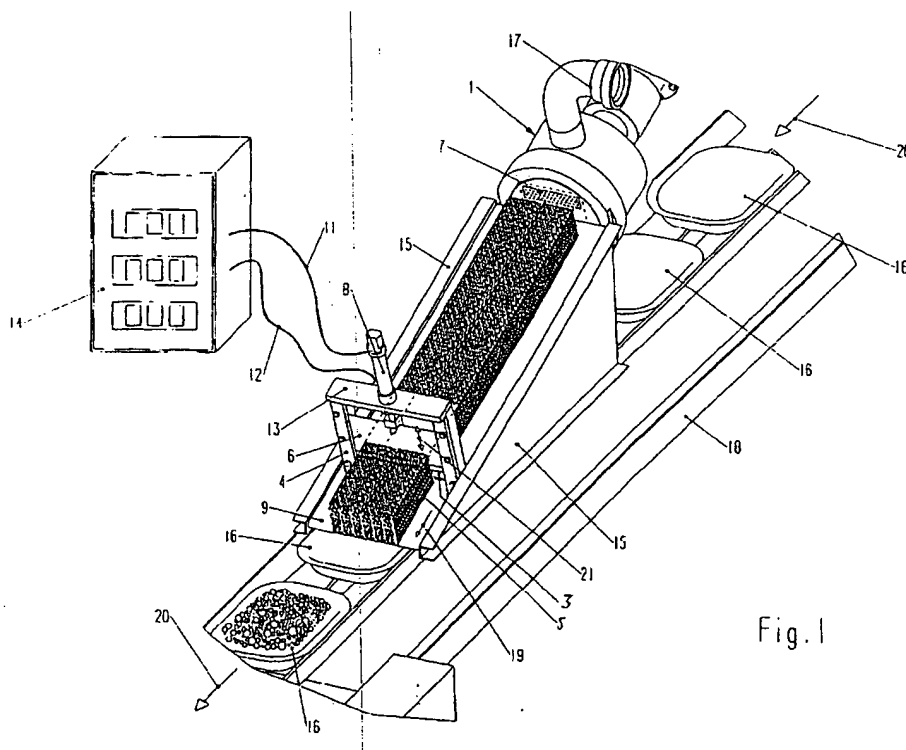


Fig. 1



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# EUROPEAN SEARCH REPORT

Application Number  
EP 00 83 0011

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 5 827 561 A (DUVE MANFRED) 27 October 1998 (1998-10-27)	1,2	B26D7/30 B26D7/06 A22C7/00
A	* abstract; figure 1 *	3,4	
Y	US 3 020 687 A (JOA CURT G) 13 February 1962 (1962-02-13)	1,2	
A	* column 15, line 70 - line 75; figure 28 *	3,4	
A	US 4 530 132 A (WAGNER RICHARD C) 23 July 1985 (1985-07-23)	1-4	
	* the whole document *		
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A	US 4 193 272 A (BERNARD VINCENT E) 18 March 1980 (1980-03-18)	1-4	
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			B26D A22C A22D A21C
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 26 March 2003	Examiner Wimmer, M
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone  Y : particularly relevant if combined with another document of the same category  A : technological background  O : non-written disclosure  P : intermediate document</p> <p>T : theory or principle underlying the invention  E : earlier patent document, but published on, or after the filing date  D : document cited in the application  L : document cited for other reasons  &amp; : member of the same patent family, corresponding document</p>			

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on  
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